ulated by and under the perfect control of one will, that is felt in every curve and line. There is some likeness to the thousand personal activities of a regiment seen on their "winding way." And all this perfection of control of so many and complicated activities is true, whether a serpent like an ogre be crushing its victim's bones, or as a limbless posturist be going through its inimitable evolutions. In our thinking a serpent ranks as a paradox among animals. There is so much seeming contradiction. At one time encoiling its prey as in iron bands; again assuming the immovable posturing of a statue; then melting into movements so intricate and delicate that the lithe or limbless thing looks like gossamer incarnate. In this creature all the unities seem to be set aside. Such weakness, and such strength; such gentleness, and such vindictiveness; so much of beauty, and yet so repulsive; fascination and terror:—what need of wonder that whether snake or python, the serpent should so figure in the myths of all the ages, and the literature of the whole world! Yes, in the best, and the worst thinkings of men!

## BOTANICAL OBSERVATIONS IN SOUTHERN UTAH, IN 1874. I.

BY DR. C. C. PARRY.

THE hastily gathered collection of plants made by Fremont on his adventurous return trip from California, in the spring of 1844, contained quite a number of remarkable new forms, from the little known district adjoining the valley of the Virgen, then included in the Mexican Territory of Upper California. Several of these newly discovered plants, as far as the imperfect material allowed, were described by Dr. Torrey and Prof. Gray, in Fremont's Report, "Plantæ Fremontianæ," and other scientific publications. Subsequently the inaccessibility of the country, and the hostile character of the Indian tribes occupying this district, prevented for a time farther botanical researches. With the growth of Mormon settlement gradually extending southward from Salt Lake, the obstacles to exploration were in great measure removed and the valley of the Virgen lay along the line of one of the travelled routes to southern California. During this period, late in the year

1855, a French naturalist, named J. Remy, passed over this route from Salt Lake to Los Angeles, and made a scanty collection of plants on the journey, which were afterwards deposited in the Paris Museum. His published narrative, entitled "Pays des Mormons," contained only very general allusions to the botany of the region traversed, and no scientific account was given of his collections, the material being apparently imperfect and fragmentary. Since then, up to the year 1870, we have no account of any botanical collector visiting this district. At the latter date (1870), at the suggestion of the writer, Dr. E. Palmer, then in the joint-service of the Department of Agriculture, in Washington, and the Smithsonian Institution, was induced to visit this section on a collecting tour, extending to the mouth of the Colorado and the Pacific coast. Leaving Salt Lake in the latter part of May, he spent about three weeks in the vicinity of St. George, collecting in that vicinity a number of new species of plants which were mainly described in Mr. Watson's Botanical Report of the geological exploration, 40° parallel, vol. v.

In the following years (1871-2), the expeditions of Lt. Wheeler and Major Powell, both touched on this district, and small collections of plants, made by Mrs. E. P. Thompson, Capt. Bishop and others connected with these surveys, added several new species to the flora of this district, being described by Mr. Watson in the AMERICAN NATURALIST (Vol. vii, pp. 299–303).

In addition to these published sources, several local collectors have at different times aided materially in extending our knowledge of the plants of this region, among whom may be mentioned as especially worthy of notice, Mr. A. L. Siler, and J. E. Johnson, Esq., both residents of southern Utah.

Being desirous of obtaining a more complete view of the botanical features of this district, and especially of securing the evanescent spring plants, which on account of the late season of gathering or hasty mode of travel, other collectors had mainly neglected, the writer undertook a botanical collecting tour, early in the present season (1874). It seemed like anything but a promising prospect for the success of this enterprise, to encounter on my arrival at Salt Lake, March 20th, a snowfall of nearly two feet, interfering seriously with the ordinary means of travel, and rendering the journey over the high intervening country, between Salt Lake and St. George, a distance of 350 miles, exceedingly tedious and disagreeable.

Not before passing over the rim of the great basin, within a short day's travel of my destination, was there any appearance of advancing vegetation; but on dropping down suddenly into the valley of the Virgen, on April 5th, the whole floral aspect assumed a change almost magical; orchards in full bloom including peach, almond, and apricot, marked at a distance by a perfect blaze of blossoms the scattered settlements, while the lucerne fields with their deep green foliage were nearly ready for a first forage crop.

Over the intervening desert table-land the aspects of advanced spring were evidenced in rainbow-colored patches of *Phacelia Fremontii* Torr. and bright yellow clusters of *Eunanus Bigelovii* Gray (No. 147). The approach to St. George, which I had previously selected as the central point of my explorations, was at this season, and under the circumstances of the case in contrast with the bleak country just passed over, peculiarly attractive. The variety of rock exposure in the form of steep mural cliffs of red sandstone, and high basaltic *mesas*, with their slopes of broken *talus*, gave promise of a rich harvest, which the result of my labors fully realized.

From the 5th of April up to June 1st, there was a continuous succession of interesting forms, almost bewildering in their singular botanical features. Early in the season, the chief attraction centred on the evanescent annuals, which were scattered in great profusion over every bare knoll, in rock crevices, or under the scant shelter of the dull colored desert shrubbery. Largely represented among these is the genus Phacelia, including *P. Fremontii* Torr. (No 177), whose showy spikes continue to unfold a succession of blossoms for four weeks or more. Hardly less showy is the *Phacelia crassifolia* Torr. (No. 182), with flowers of an intense blue shade, thickly scattered over gypseous clay knolls. This latter species frequently becomes dwarfed in exposed places, and spreads out in the form of purple patches over the bare soil.

In rock crevices we find the delicate *P. micrantha* (No. 181) associated with *P. rotundifolia* (No. 183), while later in the season, *P. crenulata* Torr. (No. 180), *P. curvipes* n. sp.? (No. 179), and the biennial *P. Palmeri* Torr. (No. 176), keep up the series. Hardly inferior to the above noted omnipresent forms of early spring vegetation, must be reckoned the different species of Gilia, which, though generally less showy, vie with them in variety and abundance. These latter include, besides the widely distributed and very variable *Gilia inconspicua* Dougl. (No. 199), the rarer

forms of *G. leptomeria* Gray (No. 197), *G. demissa* Gray (No. 196), *G. Bigelovii* Gray (No. 189), *G. flocosa* Gray (No. 192), *G. polycladon* Torr. (No. 191), *G. setosissima* Gray (No. 190), and a very delicate species with light yellow flowers, looking like flax, *G. filiformis* n. sp. (No. 187).

Among other interesting dwarf forms characterizing the early spring flora, may be noted *Thysanocarpus curvipes* Hook., *Malvastrum exile* Gray, *Lupinus Sileri* Watson, *Actinolepis Wallacei* Gray, *Actinolepis lanosa* Gray, *Syntrichopappus Fremontii* Gray, *Layia glandulosa* H. & A., *Styloclyne micropoides* Gray, *Nemacladus ramosissimus* Nutt., *Nama demissa* Gray, *Pterostegia drymarioides* F. & M.

Somewhat later in the season, as we shall have occasion to note farther on, a different class of annuals, largely represented by Eriogoneæ and Boragineæ, come forward to continue the series of evanescent forms.

Of perennial plants the early spring gave abundant promise, in the opening leaf and developing bud, of many strange forms. Among these the first to attract attention is a very common bushy shrub, with small inconspicuous flowers, crowded along the slender branches, almost hidden from view in the densely fasciculate leaves. This, which is readily recognized in its habit and peculiar peach-leaf odor, as belonging to the *Amygdaleæ* group of *Rosaceæ*, was characterized by Dr. Torrey in "Plantæ Fremontianæ" (fig. 10), from imperfect material under the name of *Emplectocladus fasciculatus* Torr. The more complete material now collected shows it to be not generically distinct from Prunus, being indeed closely allied to the *Prunus minutiflora* Engel.; it has accordingly been reduced by Prof. Gray to a section of *Prunus*, viz.: *P.* (*Emplectocladus*) *fasciculata* Gray (No. 56). By the inhabitants of the country it is known under the appropriate name of "*wild almond*," its small fruit, though bitter, being occasionally eaten. Among other early flowering shrubs of this district, may be enumerated *Rhus aromatica* Ait., and one of the numerous forms of the variable *Amelanchier Canadensis* T. & G. Quite commonly met with in deep sandstone ravines and on rocky slopes is the singular one-leaved ash, *Fraxinus anomala* Torr. (No. 210). This forms a clumpy bush eight to twelve feet in height, with bright green foliage, set off later in the season by pendent fascicles of fruit, of which the separate seeds are not unfrequently

3-angled. From the mature seed somewhat copiously collected, it is to be hoped that this singular species may be introduced into our gardens.

Of early bulbous plants *Androstephium breviflorum* Watson (No. 223) is quite common on all gravelly hills, succeeded somewhat later in the season by *Milla capitata* (No. 256), which latter exhibits an equally well-marked corona subtending the stamens, thus apparently invalidating the distinctions which have been relied on for separating the allied genera of *Milleæ*.

Early in May, *Culochortus flexuosus* Watson (No. 254) is conspicuous on hill-sides, with its showy tulip-like blossoms, which, on account of its prolonged branching flower stem, continues to flower for a longer period than most species of this attractive genus. The general Indian name of "*Sego*" is applied indiscriminately to all the edible bulbs of this region. Apparently quite out of place in this arid climate, we notice quite frequently on the perpendicular face of moist sandstone rocks, *Adiantum*, *Capillus venesis* L. (No. 262). Still more interesting is a common fern growing in dry rock crevices, resembling *Cheilanthes*, which Prof. Eaton on a critical examination determines to be a new species of *Notholæna* characterized by him as *N. Parryi* n. sp. (See appendix No. 263).

With the disappearance of late spring frosts, which frequently continue to the latter part of April, and occasionally as late as early May, the intense heat of the lengthening days, rarely obscured by clouds, or tempered by showers, brings forward a rapid development of the more characteristic forms of vegetation. By May 1st orchards had mostly dropped their blossoms; the fruit of the apricot and almond were developing, and strawberries beginning to ripen, giving to fields and gardens a summer aspect. In the open country an analogous feature is brought to view in the native vegetation. We accordingly note the appearance of several species of Œnothera, conspicuous among which is a large yellow-flowered one, which being undescribed, I take pleasure in dedicating to my esteemed friend, J. E. Johnson, Esq., as *Œnothera Johnsonii* n. sp. (See appendix No. 64). Mr. Johnson, who has had this plant for many years in his garden, called my attention to the regularity and suddenness of its opening, from fifteen to twenty minutes after sunset. This opening process, as frequently observed by both of us, is accomplished by a shrinking

downward of the valvular calyx, the accumulated tension at a certain point suddenly releasing the segments from below upwards, which, becoming reflexed, allows the closely-confined convolute corolla to unfold visibly, its petals expanding in about thirty seconds, to a horizontal position. Quite constantly, just at this time, a small bee, apparently on the watch, darts in and loads itself with the stringy, adhesive pollen, to be carried, probably, to another flower. Generally, soon after, another bee on the same quest lands on the same flower, and finding the pollen gone, travels quickly over the stigmatic arms and soon flies away. This process frequently repeated ensures cross-fertilization.

Other *Œnotheræ* include a large white-flowered variety of the polymorphous *Œ. albicaulis* (No. 63); as a rarity we also meet with the very neat *Œ. primiveris* Gray (No. 65).

Of the group belonging to the *Chylisma* section, we have three well-marked forms represented. Of these, Nos. 73–74 are referred by Mr. Watson to *Œnothera brevipes* Gray; both have yellow flowers, of which those of No. 73 are most conspicuous. No. 74 is distinguished by a more branching habit, smaller light-yellow flowers, longer pedicels, and more conspicuous pinnatisect radical leaves. A third species of this section is characterized by Mr. Watson as *Œnothera Parryi* n. sp. (See appendix No. 72). This latter is of a singularly graceful habit, generally much branched, its prolonged spike of small yellow flowers being succeeded by distinctly clavate capsules, curving upwards from a slender divaricate pedicel. Quite constantly associated with this latter species, occupying dry gypseous clay knolls, is a very neat and showy *Mentzelia* (No. 78). This, though closely allied to the common *M. multiflora* Nutt., seems to present characters sufficient to distinguish it as a new species. Observing the two growing often side by side, the differences in habit, time of flowering and floral characters seem sufficiently distinct, nor were there any intermediate forms noticed. In the meantime it may be well to wait for a more full revision of this genus before venturing to add to the number of doubtful species.

Common at this season upon all sandstone or gravelly knolls, is the charming *Dalea Johnsoni* Watson (No. 40), with its deep indigo blue spikes. Now also comes forward *Coleogyne ramosissima* Torr. (No. 57), its dull green foliage being relieved by a profusion of light-yellow blossoms. *Aster tortifolius* Gray (No. 91),

with its large pale-blue heads, adds an unwonted brilliancy to the clefts of dark basaltic rocks. *Audibertia incana* Benth. (No. 159) is conspicuous along the line of dry ravines, with its dense blue spikes, and silvery foliage, exhaling a most pungent perfume. Other varieties include *Lepidium Fremontii* Watson, *Hymenoclea salsola* T. & G., *Franseria dumosa* Gray, *Salazaria Mexicana* Torr., *Lycium Torreyi* Gray.

Not least among the attractions of this flowering season are the Cacti, which include *Opuntia rutilla* Nutt., presenting a perfect mass of delicate pink rosettes, set in a bed of spines. *Cereus Engelmanni* Parry exhibits flowers of a deeper purple shade, which are succeeded by a delicious fruit, when it can be safely extracted from its thorny envelope. *Mammillaria phelosperma* Engel., or "the fish-hook cactus," is found as a rarity in rocky clefts, at this season adorned with its bright red fruit. On all gravelly knolls in this section a common arborescent *Opuntia* is met with (*O. Echinocarpa* Engel.). This species has an inconspicuous yellowish green flower nearly buried in a mass of barbed spines; otherwise its usually repulsive features are partly utilized by birds, who find in their spiny recesses, nesting places secure from the attack of snakes.

*Chenopodiaceæ* are everywhere largely represented by the following, viz., *Atriplex expansa* Watson, *A. confertifolia* Watson, *A. Nuttallii* Watson, *A. canescens* Watson, *Kochia Americana* Watson, *Suœda diffusa* Watson, *Eurotia lanata* Moquin, and *Grayia polygalvides* H. & A., the latter with much more graceful foliage than noticed farther north, almost reconciles one to the imposition of this honored botanical name to a "grease wood."

The undergrowth comprises quite a number of singular *Cichoraceous Compositeæ*, including *Malacothrix Coulteri* Gray, *M. Torreyi* Gray, *Rafinesquia Neo-Mexicana* Gray, *Calycoseris Wrightii* Gray, *Microseris macrochœta* Gray, *M. linearifolia* Gray, *Stephanomeria Thurberi* Gray, *S. exigua* Nutt., *Lygodesmia exigua* Gray. To these must be added as especially worthy of notice, the charming *Glyptopleura setulosa* Gray (No. 129), with its pure white blossoms, and cut fringed leaves, pressed close to the ground. This growing abundantly everywhere on gravelly soil, or dry bottom land, presents a succession of flowers opening in bright sunshine. Not unfrequently on gravelly slopes we meet with the rare *Compositeæ*, *Monoptilon bellidiformis* Gray (No. 100), heretofore only known

from a single Fremontian specimen. The large class of annual and perennial *Eriogoneæ* come forward in the latter part of May, allusion to which must be deferred to a succeeding paper, together with some more detailed notices of excursions to the higher mountains and alpine districts, south and west of St. George.

NOTE. The numbers affixed to species in the foregoing paper, correspond to the numbered sets, in the distributed collection.

## THE COLOSSAL CEPHALOPODS OF THE NORTH ATLANTIC.

BY PROF. A. E. VERRILL.

IN a former article published in the NATURALIST (vol. viii, p. 167, March, 1874) the writer gave a brief account of several gigantic cuttle-fishes, or "squids," which have been observed or captured at or near Newfoundland,[1] and in an earlier volume (vii, p. 91) Dr. Packard gave an account of previous captures of similar huge Cephalopods on the coasts of North America and Europe. The existence of several distinct species of these colossal ten-armed Cephalopods has been satisfactorily demonstrated in the various papers that have been written upon the subject both in Europe and America. Most of the specimens hitherto obtained have been taken in the Atlantic Ocean, but at least one gigantic species (*Enoploteuthis unguiculata*) inhabits the Indian Ocean, while the origin of some of the described specimens is not known.

In this article I propose to describe portions of five different specimens of these monsters, now in my possession, and also to give some account of five other specimens that have been observed on our side of the Atlantic.

The five specimens that I have been able to study evidently belong to two quite distinct species, both of which belong to the genus *Architeuthis* of Steenstrup (or *Megaloteuthis* of Kent). The largest of these is represented only by the jaws of two

[1] See also an article on this subject by the writer, in the "American Journal of Science," vol. vii, p. 158, Feb., 1874; and letters from Mr. Alexander Murray in the NATURALIST, vol. 8, p. 120, Feb., 1874.